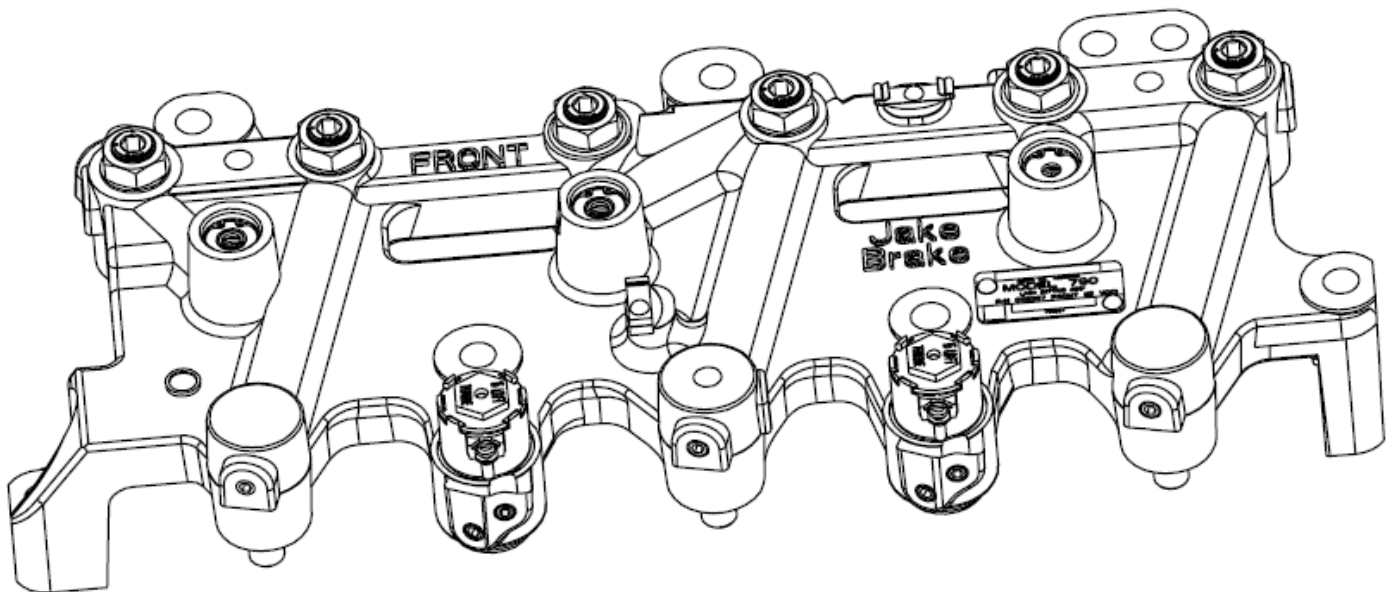




Model 797/797A/797B Tune-Up Kit

Jacobs P/N 032146



This Tune-Up Kit requires Master Piston Assembly Tool, P/N J-45976. The tool is available through Kent-Moore.

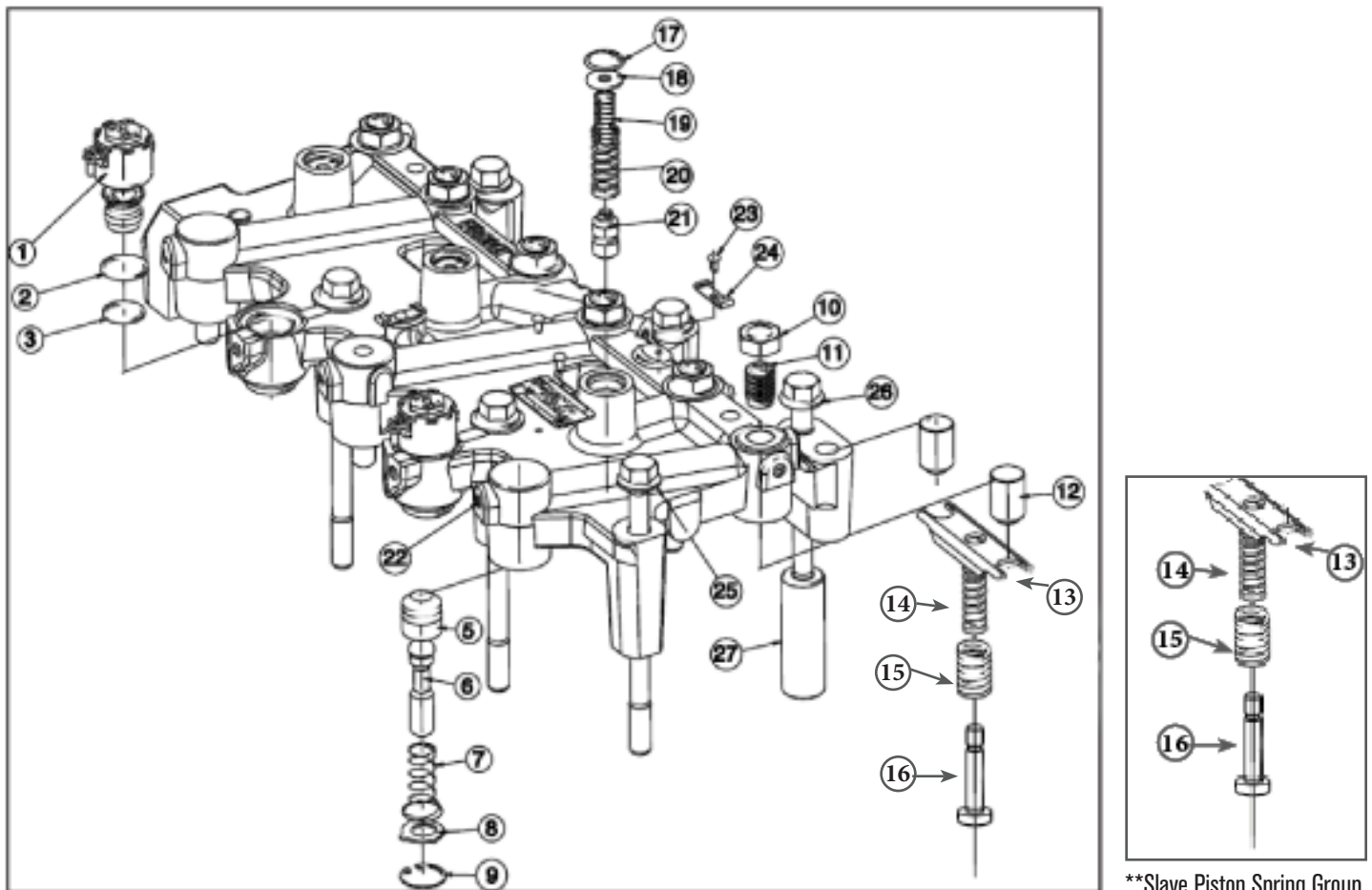
Information in this manual was current at the time of printing and is subject to change without notice or liability.

Refer to the Application Guide, P/N 24770 for specific application information. Also refer to the Installation Manual, P/N 29901 and the engine manual for specific installation instructions.

Tune-up Kit Contents

Ill. No.	Jacobs P/N	Part Name	Qty. Per Kit	Ill. No.	Jacobs P/N	Part Name	Qty. Per Kit
1	1024612	Solenoid, 12VDC S/L	0	14	031854	Spring, Inner Slave Piston	6
1	1024619	Solenoid, 24 VDC S/L	0	15	031857	Spring, Outer Slave Piston	6
1	1034737	Solenoid, 12VDC D/L (797B Only)	0	16	031639	Bolt, Shoulder-Slave Piston	6
2	020229	Seal, Solenoid Upper	2/3*	17	012991	Ring, Retainer	6
3	001082	Seal, Solenoid Center	2/3*	18	016505	Washer	6
5	031282	Master Piston	0	19	018179	Spring, Inner Control Valve	6
6	028791	Push Rod, Master Piston	0	20	010843	Spring, Outer Control Valve	6
7	028768	Spring, Master Piston	6	21	011930	Control Valve	6
8	031854	Retainer, Master Piston	6	22	028317	Pipe Plug	0
9	031331	Ring, Retainer	6	23	017303	Drive Screw	0
11	031270	Solid Screw 3/8-24 (1" Long)	0	24	029127	Clip, Wire Harness	0
12	031324	Slave Piston	0	25	028346	Capscrew, M12X1.75X170	0
	032127**	Slave Piston Spring Group	0	26	029132	Capscrew, M12X1.75X140	0
13	031635	Bridge, Slave Piston	0	27	029118	Spacer Tube	0

*797A front housing has 2 solenoids and the rear housing has 1 solenoid.



**Slave Piston Spring Group

General Information

These instructions describe how to properly remove, clean and reinstall Jacobs Vehicle Systems® components. For additional information on the Model 797 engine brakes, refer to the Series 60 Engine Installation Manual, P/N 29901.

For slave piston clearance refer to the Jacobs Application Guide for Detroit Diesel Engines, P/N 24770.

Use OSHA-approved cleaning solvent for cleaning parts. Original parts to be reused should be inspected for wear and replaced as required. Be sure to coat parts with clean engine oil when reinstalling them.

The standard Jacobs Vehicle Systems Service Parts Warranty applies to the components of this Tune-up Kit. The warranty is administered by Detroit Diesel Corporation.

Safety Precautions

The following symbols in this manual signal conditions potentially dangerous to the mechanic or equipment. Read this manual carefully. Know when these conditions can exist. Then take necessary steps to protect personnel as well as equipment.



WARNING

THIS SYMBOL WARNS OF POSSIBLE PERSONAL INJURY.



CAUTION

THIS SYMBOL REFERS TO POSSIBLE EQUIPMENT DAMAGE.

NOTE:

INDICATES AN OPERATION, PROCEDURE OR INSTRUCTION THAT IS IMPORTANT FOR CORRECT SERVICE.

Fuels, electrical equipment, exhaust gases and moving engine parts present potential hazards that could result in personal injury. Take care when installing equipment or parts. Always wear safety glasses. Always use correct tools and follow proper procedures as outlined in this manual.

Instructions



WARNING

NEVER REMOVE OR ADJUST ANY ENGINE BRAKE OR COMPONENT WITH THE ENGINE RUNNING.

Access Engine Brake

1. Thoroughly clean engine.
2. Remove valve rocker cover and gasket.

NOTE:

IF THE ENGINE HAS A TWO-PIECE COVER, THE LOWER VALVE COVER BASE DOES NOT HAVE TO BE REMOVED TO GAIN ACCESS TO THE ENGINE BRAKE HOUSINGS.

3. Disconnect the lead wires from each of the solenoid valves (1) and detach them from the wire clips (24).
4. Remove the six capscrews (25&26) and nut securing each engine brake housing. Remove the housings.
5. Retain six spacer tubes (27).

Disassemble Housings

1. Remove the solenoid valves (1) and discard the seal rings (2,3).



WARNING

WEAR SAFETY GLASSES. REMOVE CONTROL VALVE COVERS CAREFULLY TO AVOID PERSONAL INJURY. COVERS ARE UNDER LOAD FROM CONTROL VALVE SPRINGS (19,20).

2. Hold down the control valve cover while removing the retaining ring (17). Remove and discard all parts.
3. Loosen the locknuts (10) and remove the adjusting screws (11) and locknuts. Retain the adjusting screws and locknuts.
4. Remove the shoulder bolt and springs (14,15) that retain the slave pistons; discard springs and shoulder bolts. Remove and save the bridge (13) and slave piston (12).
5. Remove master piston retaining ring (9), master piston retaining washer (8), master piston spring (7), master piston pushrod (6), and master piston (5). Use caution while removing the master piston retaining ring. Excessive prying against the master piston bore may cause damage. Retain master piston and pushrod. Discard all other components.

Assemble Housings



WEAR SAFETY GLASSES WHILE BLOWING THE OIL FROM THE BOLT HOLES.

1. Clean all parts in an approved cleaning solvent. Dry with compressed air.
2. Coat all parts to be installed into housings with clean lube oil.
3. Reinstall all original slave pistons (12) and bridges (13), reversing the removal procedure.
4. Install the new shoulder bolts (16) and springs (14,15). Tighten the bolts to 23 Nm (200 lb-in).
5. Re-install original master pistons (5) and pushrods (6). Install new master piston springs (7). Use master piston assembly tool (P/N J-45976 from Kent-Moore) to install master piston retainers (8) and retaining rings (9). Visually inspect to ensure the retaining rings are fully engaged.
6. Install the adjusting screws (11) and locknuts (10). Do not tighten the locknuts at this time.
7. Install the new control valves (21), springs (19,20), washers (18) and retaining rings (17). Rotate the retaining ring 90° after installation to ensure that the ring is seated in the groove.
8. Install the upper (2) and center (3) seal rings on the solenoid valves. Coat the seals with engine oil prior to assembly.

NOTE: NEW UPPER SEAL RINGS CAN BE IDENTIFIED BY A YELLOW STRIPE

9. Insert the solenoid valves and torque to 20 Nm (15 lb-ft).

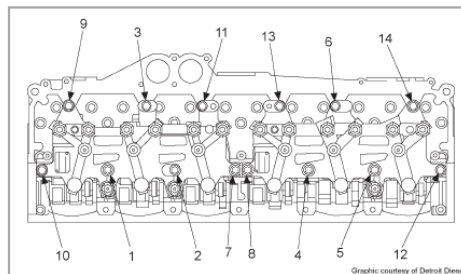
NOTE: INSTALL THE SOLENOID CAREFULLY TO AVOID CUTTING OR TWISTING THE SEAL RINGS. IMPROPER INSTALLATION COULD RESULT IN POOR ENGINE BRAKE PERFORMANCE.

1. Set front and rear Jake Brake housings on rocker shafts locating on retorqued studs. Ensure that master piston pushrods will engage with pocket located on top of injector rocker arm.
2. Lubricate each hold-down capscrew with clean engine oil prior to installation.
3. Install three M12x170 capscrews (25) on solenoid side of brake. Install three M12x140 capscrews (26) on the exhaust side of the engine.



INSTALLING 170 MM CAPSCREWS (25) ON THE EXHAUST SIDE OF THE ENGINE CAN RESULT IN SERIOUS ENGINE DAMAGE.

4. Before tightening the capscrews, move the housing from side to side. Position housing in the center of the range of motion.
5. Tighten the capscrews or nuts per sequence in figure below at 80 lb-ft (180 Nm).



6. Verify exhaust and intake valve lash is still within DDC specifications for engine. If valve lash is out of tolerance, refer to DDC manual for resetting procedure.
7. Connect the lead wires to the solenoid valves passing the wires through the wire clips.
8. Torque solenoid screw to 1 Nm (9 lb in).

797B APPLICATIONS UTILIZE A DDC WIRE HARNESS TRAY WHICH IS ATTACHED ONTO THE REAR BRAKE HOUSING - WIRE CLIPS DO NOT APPLY TO THIS MODEL.

NOTE:

REFERENCE THE DDC SERIES 60 ENGINE SERVICE MANUAL P/N 6SE483 FOR PROPER TRAY TORQUING PROCEDURE.

Install Engine Brake Housings

REMOVING THE OIL FROM THE BOLT HOLES PREVENTS THE CYLINDER HEAD FROM CRACKING WHEN BOLTS ARE TIGHTENED. ATTACH A LENGTH OF TUBING TO AN AIR GUN NOZZLE AND BLOW OUT THE OIL FROM THE HOUSING HOLD-DOWN BOLT HOLES. COVER THE HOLES WITH HAND TOWELS TO MINIMIZE OIL SPRAY.



Adjust Slave Piston Clearance



FAILURE TO FOLLOW ADJUSTMENT PROCEDURES CAN RESULT IN ENGINE OR ENGINE BRAKE DAMAGE.

NOTE:

MAKE SLAVE PISTON ADJUSTMENT WITH THE ENGINE STOPPED AND COLD. ADJUST EACH CYLINDER WITH THE EXHAUST VALVES IN THE CLOSED POSITION.

1. Back out the adjusting screws on the slave pistons until the slave piston does not touch the rocker arm.
2. Insert the proper feeler gage between the slave piston and the exhaust rocker adjusting screw. Using a 3/16 inch hex wrench turn in the adjusting screw until the slave piston contacts the exhaust rocker adjusting screw through the feeler gage.
3. Hold the adjusting screw in place and torque the lock nut to 38 Nm (336 lb-in). Recheck lash settings. If lash setting is incorrect, repeat steps (1) through (3) above.

2. Watch the slave piston assembly. It should move down to contact the exhaust valve rocker arm adjusting screws.
3. Check each housing to be sure it is functioning.
4. Shut down engine.

Engine Brake Operational Check



WEAR EYE PROTECTION AND DO NOT EXPOSE YOUR FACE OVER THE ENGINE AREA. TAKE PRECAUTIONS TO PREVENT OIL LEAKAGE ONTO THE ENGINE. COVER CONTROL VALVE AREAS SUFFICIENTLY TO PREVENT OIL SPLASH.

Bleed the engine brake housings.

1. Be sure wires are away from moving parts.
2. Start the engine and allow to run for a few minutes
3. Manually activate the solenoid valve several times to allow the housing to be filled with oil.

NOTE:

THE SOLENOID VALVE IS MANUALLY ACTIVATED BY DEPRESSING THE ARMATURE. THE ARMATURE IS LOCATED IN THE CENTER OF THE TOP OF THE SOLENOID.

Check for proper operation.

1. Manually activate the solenoid valve and watch that the master piston pushrod is moving down into the injector rocker arm pocket.

